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The American Museum Journal

CONTENTS FOR NOVEMBER, 1911

Coöperation in Education.....	WILLIAM H. MAXWELL	219
The Museum and the Public Lecture.....	HENRY M. LEIPZIGER	220
A Word of Congratulation from President John H. Finley.....		220
The Museum of the Future.....	HENRY FAIRFIELD OSBORN	223
Evolution of the Educational Spirit in Museums		
	FREDERIC A. LUCAS	227
Professor Albert S. Bickmore: Educator....	EDMUND OTIS HOVEY	229
Educational Value of the American Museum..	MAURICE A. BIGELOW	234
Cordial Recognition of the Museum's Work.....		236
1. Museum and High School United for Health and Economic Welfare	GEORGE W. HUNTER	
2. The Museum Increasingly Helpful for Ten Years..	LILLIAN BELLE SAGE	
3. The Museum a Laboratory for Classes.....	ANNA M. CLARK	
4. How One Crowded High School uses the Museum..	JAMES L. PEABODY	
The American Museum and Education.....		242
1. Coöperation with the Public Schools.....	GEORGE H. SHERWOOD	
2. Fossil Vertebrates — What They Teach.....	W. D. MATTHEW	
3. The Habitat Groups of Mammals and Birds.....	J. A. ALLEN	
4. Educational Aims of the Department of Invertebrate Zoology		
	HENRY E. CRAMPTON	
5. The Museum Library.....	RALPH W. TOWER	
6. Arrangement of Exhibits in Anthropology.....	CLARK WISSELER	
Symposium of Expressions from Primary and Grammar Schools...J.		255
The Children's Room of the Museum.....	AGNES ROESLER	260
Tuesday at the Museum.....	MARY B. C. BYRNE	262
Museum News Notes.....		264

MARY CYNTHIA DICKERSON, *Editor*

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THEY BEHOLD A "CITY" OF STRANGE BIRDS

Some of the brightest spots in childhood are connected with a vague realization of the beauty and mystery of the world

The Museum wishes to welcome and honor the children who come within its walls. It publishes in this number of the JOURNAL the pictures of a few of the children who have been among its recent visitors

The American Museum Journal

VOL. XI

NOVEMBER, 1911

No. 7

COÖPERATION IN EDUCATION

By William H. Maxwell

Superintendent of Public Schools, New York City

THE present contract for coöperation has existed between the public schools and the American Museum of Natural History for more than thirty years. Meantime the development of the schools has paralleled the growth of the Museum and both have kept pace with the phenomenal upbuilding of the city. For the Museum's part in this I extend my congratulations, because while the public school system has but developed in accordance with the progressiveness of the times, the Museum has broken away from all records of museum organization and maintaining its stand as an institution of science has distinctly identified itself with education also. By so doing it has made possible for the children of the City of New York many good things from which they would otherwise have been shut off.

The teachers of several thousands of classes in the schools are working under a difficulty of conditions not equalled in any other quarter of the globe. One-third of the hundred thousand new pupils of each year cannot speak English and moreover come from centers of the City where people live one thousand to the acre and have the attendant ills of such a congestion of population. The problem is to galvanize these classes into a spontaneity of interest that will carry them into a new language, into the knowledge of the grade and at the same time into a more wholesome, more sanitary life. For these teachers the Museum's lectures and collections serve royally in the threefold purpose.

I hail with satisfaction the trend of the Museum's work in its new department of public health, and in its woods and forestry and habitat groups which form a continually stronger lure to out-of-door life. Even if nature study may not yet have been developed to give children practical knowledge for life activities, it most positively does give a large working interest in the direction of such knowledge.

It will be increasingly the pleasure of the teachers to use the power the Museum puts into their hands. In the near future these boys and girls will be in control of the destiny of our City and the Museum's present coöperation in their education will bear fruit a few years hence in citizens more fitted to deal wisely with large questions on which depend health and moral well-being. For the study of nature is the foundation of that knowledge which leads to increased productivity in industry and of those ideals of life that make for improved conditions of living.

THE MUSEUM AND THE PUBLIC LECTURE

By Henry M. Leipziger

Supervisor of the Public Lecture System of the Board of Education, New York City

ON the occasion of the laying of the corner stone of the Museum about thirty-five years ago, Professor Henry of the Smithsonian Institution used these words: "How incomparably greater would the importance of this Museum be were there connected with it a professor who would give courses of free lectures on the objects which it contains, who would expound the laws of the phenomena of nature, who would discourse on the changes the world has undergone during geological periods."

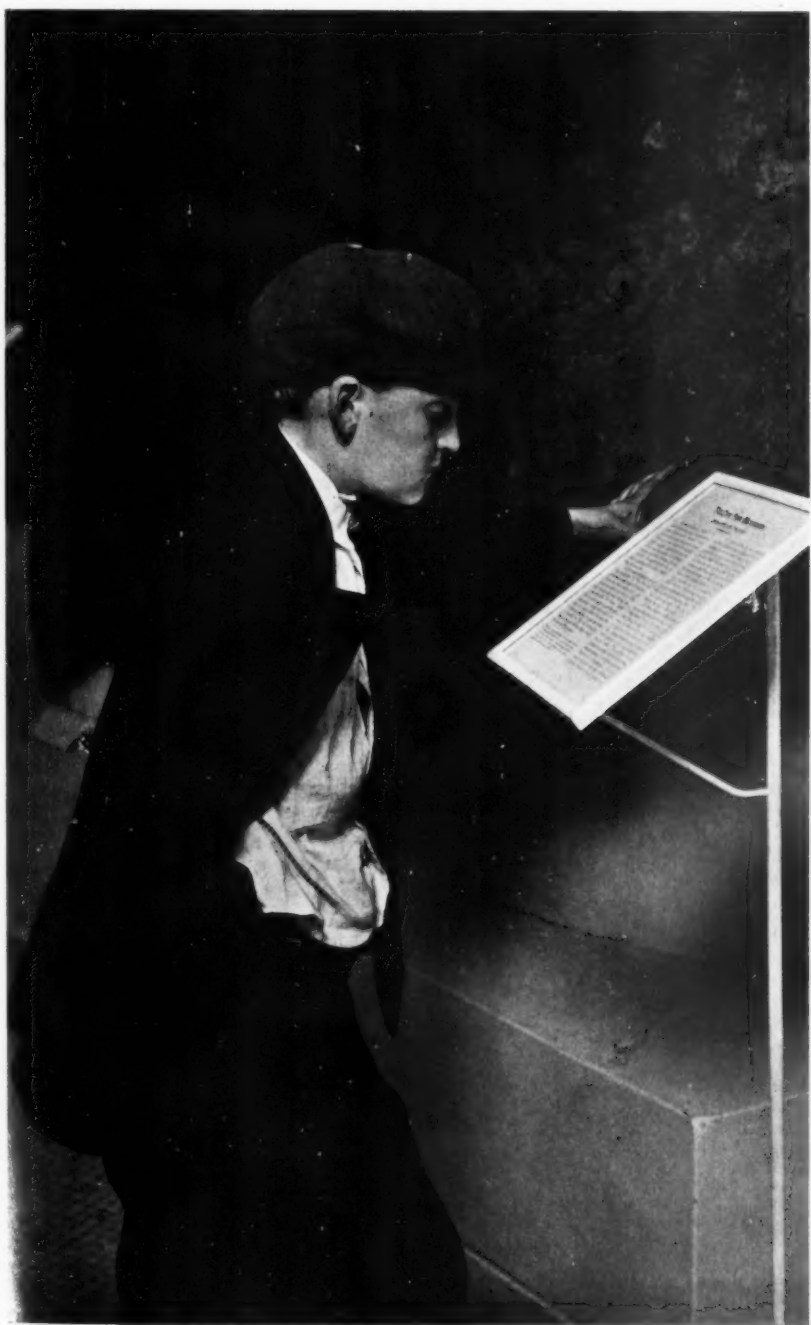
The Public Lecture System of the Board of Education coöperating with the American Museum of Natural History carries out the suggestion made by the distinguished scientist and continues a work inaugurated by Professor Bickmore soon after the erection of the first section of the Museum building. Many lecturers carry the treasures of the institution to every corner of this great city and the desire to visit the Museum is everywhere awakened. More than that those who come are prepared by these lectures to appreciate the importance and the meaning of its priceless collections.

The Museum and the public lecture add to the joy of life as well as to the knowledge of life. They teach that knowledge is not alone a means of livelihood but a means of life. Both are doing their share to increase the number of those who take delight in nature and its wonders; who find genuine recreation in it; who find a solace when sorrow comes; who become strengthened to resist temptation.

Many of the greatest men of science have come from the humblest surroundings. The immortal Faraday, while attending a course of lectures by Sir Humphry Davy at the Royal Institution, caught the inspiration which determined his future career. So may other men arise to benefit the world, who shall have been directed to their career through the combined influences of the museum and the public lecture.

A WORD OF CONGRATULATION FROM PRESIDENT JOHN H. FINLEY OF THE COLLEGE OF THE CITY OF NEW YORK

THE development of the Museum of Natural History as a vital force in the community is most gratifying. It is persuading the past to help the present and compelling both through its guidance of public opinion to make living under urban conditions better in the future. I am particularly grateful for what the Museum is doing toward bringing within the reach of the schools and higher equivalent institutions the advantages of the institution as far as possible. The Museum is no longer accurately defined as a "repository"; it is a great living teacher.



ABSORBED IN STUDY OF THE METEORITES

"Many of the greatest men of science have come from the humblest surroundings....
So may other men arise to benefit the world, who shall have been directed to their career
through the combined influences of the museum and the public lecture"



With the pelicans. The Museum is a wonder world of true stories for the younger children who are brought to the Museum by the boys and girls of school years



Studying the home'life within an Indian tipi. As one walks about the Museum, he can but remark the large numbers of children eagerly recording what they see or copying facts from labels. The sight is a spur to the Museum to give its exhibits a still more civic trend, a still more human touch and to make its labels tell more fully and simply just what the child wishes to know and should know

THE MUSEUM OF THE FUTURE

By Henry Fairfield Osborn

FOR the American Museum this is Teachers' Year, and our energies are for the time turned chiefly in the direction of making the institution a more vital part of the great free civic educational system in which New York is destined to lead the world. To set this forth we have prepared an educational map, which shows what our City offers as a whole in its combined schools and libraries, in science, literature and art; no other city in the world offers so much or offers it so generously. I wish we could afford to put this map into the hands of every teacher and every pupil, for study of what might be called the "geography of things worth seeing and worth doing." To show more clearly what may be seen in this Museum we are also issuing to-day a new *Guide Book* to all the exhibits.

In Pittsburgh recently I was delighted to meet a party of San Francisco public school boys who had worked their way east through all the great cities, and to learn that while in New York they had spent the greater part of their time in the Natural History Museum, in the Zoölogical Park and at the Aquarium. This little incident in itself proves that we have already advanced far along educational lines; but we are still not satisfied, and Director Lucas and the Scientific Staff are concentrating their time and attention for three or four months on the practical and very difficult problem of elucidation of all the exhibition halls. You have little idea in walking through these halls what labor they have involved, what sacrifices men have made and are making for them to-day in all parts of the world, how much the workers in this Museum are attached to what may be called the spirit of the institution — namely, the desire to extend the call and vision of Nature.

We realize that teachers cannot all be specialists, that we must make many of our special collections more readily understood by you, if you in turn are to bring your pupils here and explain objects and principles to them. In so far as we draw on public funds, public education is our chief and final purpose; toward this all our plans tend; for this the City erects the great building and gives the larger part of the maintenance; for this the Trustees and other friends give their time and means; for this members of the Scientific Staff are exploring in all parts of the world, collecting and arranging objects of natural history constantly inventing new methods to attract and to impress visitors, young and old.

Very few people, even among those who have the means to travel, really see Nature in the sense of understanding it, and to the millions within the cities Nature is practically unknown. So we are interpreters; we are trying to tell in a very simple way the laws which the greatest minds have wrestled with from the earliest times, and we are also trying to add to these

laws, for it is part of the genius of the institution to create new knowledge as well as to spread it. This gradual elucidation of the deep and difficult is to my mind one of the most marvelous features in the growth of science. Some great law is first in the will of the Creator, then, like the light of a star so distant that it takes ages to reach the earth, it reaches the mind of some great naturalist, and finally it comes down, down, down to the vision of the very youngest. And the best way to learn one of these laws is to see it in operation; this is far better than to read about it, for what is seen becomes part of oneself.

In the development of our halls there is a constant effort to shut out the human artificial element, to bring the visitor directly under the spell of Nature, as under a great and infinitely gifted teacher, by making every case, every exhibit, tell some clear and simple story which appeals at once to the imagination, to the reasoning instinct and to the heart.

There are three especial ends we are endeavoring to advance this year: first, to bring within your grasp the scope of the Museum as a whole; second, the particular meaning and lesson of each of its parts; third, how this meaning may best be impressed on the young mind. I believe strongly that the average child is a better nature observer than the average adult, and if you let children alone they will see a great deal. Thus there are one or two suggestions which I would make from more than thirty years of experience as a teacher: first, look at the object and get all you can out of it yourself, then read about it; second, try to make the child work out the reason of things before you work it out for him. In brief, nearly all the works and processes of man are complex, and one great lesson we have to learn from Nature is its simplicity. Here are to be seen simple lessons in animal and plant architecture, in beauty, in government, in coöperation, in endurance. Among the insects, the ants, bees and wasps lead wonderful lives, not alone in their industry; we may consider all their ways and be wise. The moral lessons, much needed for our day and generation, to be learned in the *Habitat Groups of Birds* are endless — the maternal and paternal love, the happy family life of the young, the joy of living, the beauty of their homes. Many of the so-called savages shown in this Museum can teach us far more than the so-called civilized peoples — their industry, their patience, their sense of beauty which adds the æsthetic touch to all their implements, often their integrity, their courage, their fidelity.

Nature study in the school and in the open already has hosts of friends; it is no longer on trial, it is an established system. Nature study in the museum is a newer part of the same educational movement. The great museum can, however, do what neither school, college, nor even the university can; it can bring a vision of the whole world of nature, a vision which

cannot be given in books, in classrooms or in laboratories. This is a branch of public education which is especially urgent in a great city, crowded with the works of man, and where except for the nightly vision of the heavens obscured by smoke and dust, and the altered wild life of our parks, the works of Nature are totally destroyed.

Our future ideal for the Museum is to provide at no cost a little journey on this planet and among the heavens beyond it. Our ideal of museum order is to pass, by a natural and easily seen sequence, from country to country as you would in travel, or from age to age in the past history of the earth, or from lower to higher stages of life in the history of animals and plants. This is what we are working toward although it is by no means attained. We propose to add astronomy, and geography of the land and of the sea to the older and traditional subjects of the museum. Already the child can see here what Aristotle dreamt of but never saw, and what Darwin and Huxley put into prophecy but did not live to see.

We want the teachers of New York to feel that this Museum is part of their educational plant, we want their coöperation, their suggestions, and their frequent presence.





EVOLUTION OF THE EDUCATIONAL SPIRIT IN MUSEUMS

By Frederic A. Lucas

The motto of the American Museum is "For the People, For Education, For Science" and the institution has ever striven to live up to that motto. Hampered somewhat at first by the bonds of heredity and tradition it was the first museum in this country to plan exhibits for the public alone; it has been a leader in the cause of education and has ever tried to set an example for sister institutions to follow

MUSEUMS were not educational at the outset. Not only this, the benefit of the public was something that did not enter into the thought of their founders. For museums had their origin in the collections of paintings, statuary, and other objects of art, brought together by men of wealth to gratify their love of the beautiful, or in collections of natural objects and "curios" gathered mainly too by men of wealth, to gratify their desire to know something of the life of distant lands. Then came collections brought together by scientific societies with a real desire to foster knowledge, although mainly of benefit to a few individuals, and then the museum, opened to the public on the payment of a fee and quite as much for the amusement of visitors as for their instruction.

Yet we must not forget that Peale the artist, a contemporary of Washington, conducted one of these semi-popular, semi-scientific museums and that in many ways his ideas of the educational possibilities of museums were quite in accord with those held to-day. At a time when public schools were just springing into existence and free libraries did not exist at all, the establishment of free museums could not be expected, the more that according to the views of some the public museum is the latest and highest, though by no means last, institution for public education. First we have public schools, then libraries and now the museum. The opening of the Louvre to the populace seems to have been the first really free public museum and this was rather an expression of the fierce demand for "Liberty, Equality and Fraternity" than done with a deliberate intent to benefit the people.

Love of beauty precedes the love of knowledge, so the opening of the Louvre preceded the opening of the British Museum. To us the view then taken of the conduct of a *free* museum is somewhat amusing. When we do not have at least five hundred visitors a day at the American Museum we begin to worry lest the public is losing interest or our collections ceasing to be attractive; and yet at the outset the number of visitors that might enter the British Museum in one day was limited to thirty. We not infrequently have an attendance of one thousand to twelve hundred at one of our lectures. Under the old regime it would have taken that audience an entire year to pass through the British Museum.

Little by little this state of affairs has changed. The public was first permitted, then invited, then heartily welcomed to enter the museum.

Also as the attitude of museums has changed, so has the character of their collections, or to be exact, the character of the part the public sees and in which it is interested — the exhibits.

The museums of fifty years ago or even much less were rather dreary affairs compared with those of the present day. The visitor was greeted by row upon row of animals, most literally stuffed, arrayed in ranks and accompanied by labels whose principal mission was to convey to the public what to them is a most unimportant matter, the scientific names.

The aim of the modern museum is to illustrate ideas, not merely to display objects, to take the facts or information gathered by long years of patient study and so present them that they may be understood by everyone. More than that it aims to present these facts in such manner as to interest the visitor, having come to understand that if you cannot interest him you cannot instruct him. For the average museum visitor does not come in search of knowledge but to be interested, and "rational amusement" was long ago counted as one of the purposes of a public museum. So instead of a host of beasts, birds, and fishes marshalled in serried cohorts we have our groups showing not only what the creatures are, but where they live and what they do. In our ethnological halls you see not only the objects used by strange and far-off peoples, but the people themselves engaged in the occupations of everyday life.

We have our Children's Room though this is merely in its beginning, our lectures, our guides to the collections, all with the purpose of making the collections of real use to visitors.

These things have not come to pass all at once; they have come about as a part of the evolution of museums, for there is an evolution of ideas and institutions, as well as of living things. I can recall every step in the progress of the American Museum; I have seen it change from a mere storehouse of objects to a great educational institution.

Dr. Goode of the National Museum used to say that the aims of a museum were three — record, research, and publication: record by the preservation of objects, research by their study, and publication by giving to the world the information thus gained. Had Dr. Goode been spared but a few years longer, he would have added to the above mentioned purposes of a museum the further aim, education of the public. And let me say here that no one in this country did more than he to further the educational influence of museums and that his loss was a great calamity.

An educational museum may be defined as a museum in which the objects shown, the manner in which they are arranged, and their accompanying labels illustrate some fact in nature or in the history of mankind in such manner that it may readily be grasped by all, and this is what the American Museum is endeavoring to be for the public.

PROFESSOR ALBERT S. BICKMORE: EDUCATOR

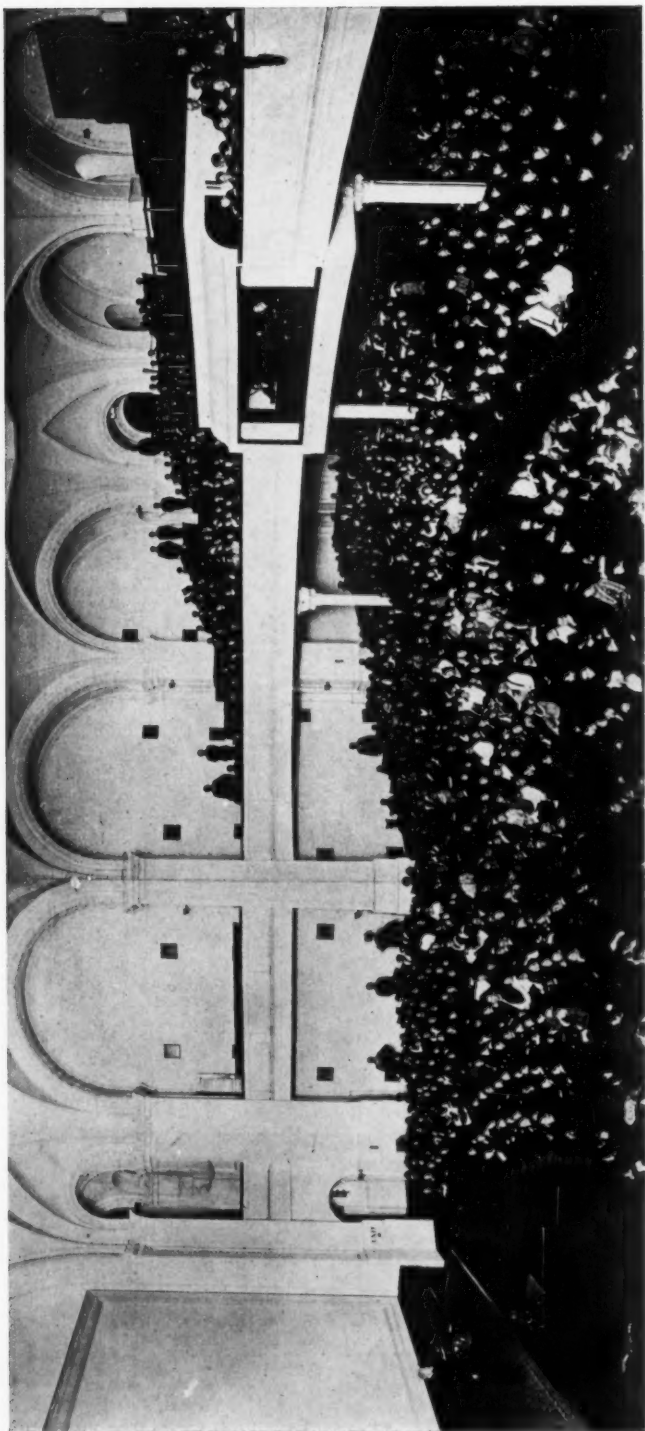
ONE OF THE ORIGINATORS OF THE AMERICAN MUSEUM OF NATURAL HISTORY,
ALSO THE ORGANIZER AND FIRST CURATOR OF THE DEPARTMENT OF
PUBLIC EDUCATION

By Edmund Otis Hovey

FORTY-NINE years ago (1862) there came to New York from the inspiring atmosphere of the laboratory of Louis Agassiz at Harvard University a young man with an idea — to establish in the metropolis of the country a museum of natural history worthy the name and the fame of the whole United States, one that should grow with the growth of the nation. That young man was Albert S. Bickmore, born of sea-faring family on the coast of Maine, brought up amid the inducements to nature study furnished by the ocean, the beach and the virgin forest, and educated at Dartmouth College. Directly after graduation with the class of 1860, he became a student under and later an assistant of the great naturalist Louis Agassiz. The conversations between Agassiz and the noted scientists of this country and Europe that took place in the famous laboratory were listened to with keen interest by young Bickmore, and were a means of broadening the youthful student's point of view. These and other experiences led to the conception of founding and building up a great museum in New York. The idea was broached to Professor Asa Gray, but he discouraged it through the feeling that New York was too commercial in character to appreciate and support such an institution. On the other hand, Dr. Jules Marcou, a famous geologist who was then residing in Cambridge, favored the plan most heartily and showed his practical interest in the museum as finally developed by bequeathing to it his extensive and valuable library of geological works and maps. The real impetus however came from a fortunate hour spent with Sir H. W. D. Acland, then the foremost naturalist and museum man of England, who heartily endorsed the young student's scheme.

Nine months' service in the Union army in 1862-1863 interrupted these plans, although part of the soldier naturalist's time was utilized in collecting mollusks for his famous teacher, but neither New York nor the country was ready for the launching of the museum project, and after the mustering out of his regiment Bickmore returned to his studies and work at the Agassiz Museum. An opportunity to go to the Far East on an exploration cruise was eagerly embraced, and three years, 1865 to 1868, were spent most profitably in China, Japan, Siberia and the Dutch East Indies.

Meanwhile sentiment in New York was ripening for undertaking the enterprise. Mr. W. A. Haines, who had the largest private collection of



230

PROFESSOR ALBERT S. BICKMORE IN THE AUDITORIUM OF THE MUSEUM

The Museum has enjoyed Professor Bickmore's services for a period of more than thirty-six years. Through his work as first Curator of the Department of Public Education the Museum's lectures became so popular that in 1900 the present Auditorium was built to accommodate the large numbers in attendance

shells in the country, Mr. D. Jackson Steward, whose collection was smaller but very choice, and Mr. Robert L. Stuart, who had many rare books, a good collection of shells and an excellent series of mineralogical specimens, with other public-spirited men, had striven in 1865 to raise funds for the proper support of the Lyceum of Natural History of the City of New York (now known as the New York Academy of Sciences) and the erection of a building for the housing of its large and valuable collections. The effort had been unsuccessful, in spite of the fact that for nearly fifty years the Lyceum had maintained in this city a natural history museum of much merit and considerable reputation. The following year, 1866, the building of the University Medical College in Fourteenth Street, in which the Lyceum collections were stored, was burned and its contents destroyed. The field therefore was clear for the establishment of a new museum which should have no connection with any existing society and should be devoted wholly to the promotion of natural history by means of research and the display of specimens. What was imperative was the advent of a man of science possessing the inspiration and energy required for bringing together the men interested in the subject and organizing the whole project.

The opportunity fell to Albert S. Bickmore, who while on his journey in the East had corresponded actively with Mr. William E. Dodge, 2d., with constant reference to the ultimate establishment of a natural history museum, Mr. Dodge and Mr. Theodore Roosevelt, Sr. being particularly interested in such a project. When Mr. Bickmore returned the war was over; the North had entered on a period of great prosperity; men of affairs had become used to the thought of large enterprises involving the expenditure of great sums of money, and the young naturalist himself was better equipped than before for developing and pushing plans for a really great museum. He had the boundless enthusiasm of youth and the buoyancy of a wonderfully sanguine disposition. He was full of his subject and by reason of his very enthusiasm New York's men of means were forced to listen to the poor young man from Maine. In season and out of season the museum project was brought forward, until in the autumn of 1868 were held the first informal conferences at the residences of Mr. W. A. Haines, Mr. Benjamin H. Field and Mr. Robert Colgate, that led to the sending of a letter¹ to the Commissioners of Central Park offering to procure a certain rare and valuable collection as the nucleus of a museum of natural history if the Commissioners would provide for its reception and development. This offer was accepted over the signature of Andrew H. Green,

¹ This letter was signed by Messrs. James Brown, A. T. Stewart, B. H. Field, Adrian Pelin, R. L. Stuart, M. O. Roberts, Theodore Roosevelt, George Bliss, M. K. Jesup, W. T. Odgett, J. D. Wolfe, Robert Colgate, I. N. Phelps, L. P. Morton, W. A. Haines, J. P. Morgan, A. G. P. Dodge, D. J. Stewart and Howard Potter.

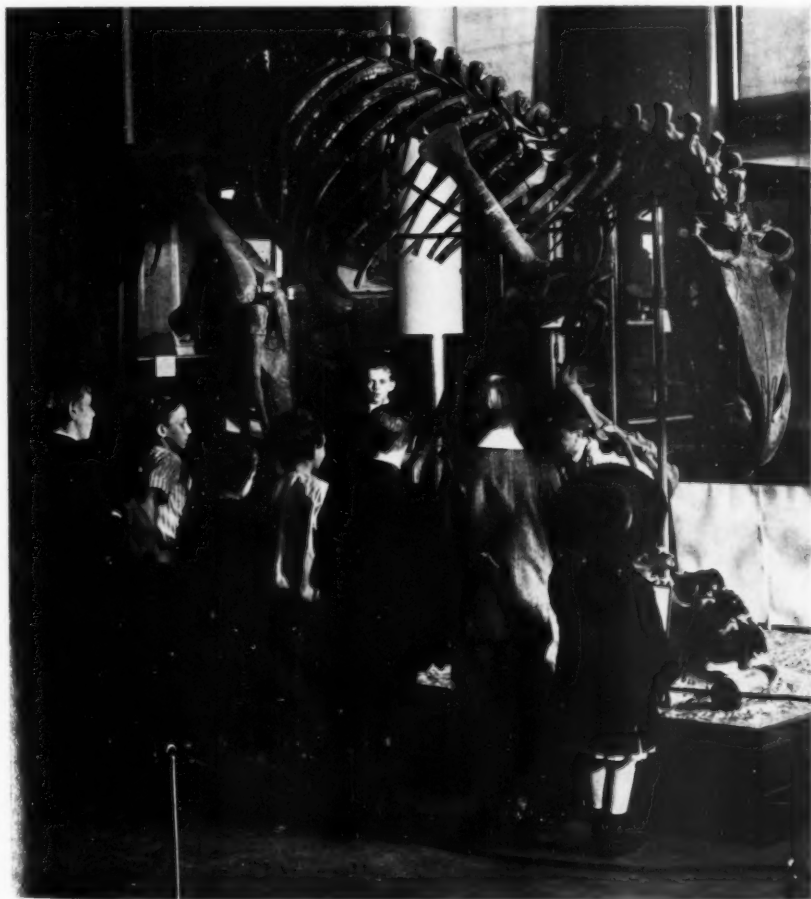
then Comptroller of the Park, and on the 19th of January, 1869, a meeting was held at the home of Mr. Benjamin H. Field. This meeting, when the first Board of Trustees was chosen, is considered the actual foundation of the American Museum of Natural History.

The draft of the present charter was drawn up by Hon. Joseph H. Choate and accepted without change at the next meeting. When the question arose as to the manner of raising the money for the running expenses of the institution, it was Professor Bickmore who suggested the plan which has worked so well that it has since been adopted for other institutions, whereby the municipality provides the ground and the buildings and pays a certain sum per year toward "maintenance," which includes salaries and wages, heat, light, power and repairs, while the collections are owned in the name of the trustees of the institution and are increased by the expenditure of special and general funds provided for through their efforts. Professor Bickmore also was the one who made the happy suggestion that the word "American" be included in the name of the institution, thus indicating its national scope, and it was he to whom was intrusted the delicate and important mission of presenting to the State legislature the bill incorporating the museum. Through the influence of the Hon. Samuel J. Tilden and Senator William M. Tweed the bill was passed exactly on the broad lines devised by the founders. In later years Professor Bickmore was an important agent of the Trustees in getting Manhattan Square reserved exclusively for the purposes of the Museum, in changing the course of the transverse road through Central Park so that it ended at West Eighty-first Street instead of at West Seventy-ninth Street, as originally projected, in procuring the establishment of a carriage entrance to Central Park at West Seventy-seventh Street, and in obtaining through the legislature appropriations from the city for one section after another of the Museum building till seven integral portions of the great structure were completed.

As first superintendent of the Museum — 1869 to 1884 — Professor Bickmore was constantly in touch with the Trustees in perfecting their plans. Thus his impress was made upon the dimensions and general plan of the complete building, the proportions, lighting and original casing of the first section (now known as the North Wing) and he was concerned with the acquisition and first installation of many of the early collections. On May 11, 1885 he was elected to the Board of Trustees.

The general public came to be most familiar with Professor Bickmore's connection with the Museum through the Department of Public Instruction, organized in 1880 at his suggestion for the purpose primarily of familiarizing the teachers of the public schools with the collections on exhibition by means of lectures illustrated with specimens and lantern slides. From

the humble beginning in 1881 the lecture courses rapidly grew in importance until in 1884 State aid was given to this feature of the Museum work, greatly extending its scope and value. In 1889 a small lecture hall was provided where the present foyer is, and finally appropriations were obtained for the construction of the lower portion of the great central tower designed to be the dominant feature of the completed building. The new section was devoted exclusively to an auditorium seating fourteen hundred persons and was opened with appropriate exercises, October 30, 1900. In the four lecture seasons succeeding this date, Professor Bickmore addressed many thousands of people here, but in the spring of 1904 ill health forced him to retire from the platform and from active participation in the affairs of the institution to which his energies had been unsparingly devoted for more than thirty-six years.



THE CHILDREN HAVE FAVORITE EXHIBITS

THE EDUCATIONAL VALUE OF THE AMERICAN MUSEUM OF NATURAL HISTORY

By Maurice A. Bigelow

Professor of Biology, Teachers College, Columbia University

THE most discouraging fact concerning our boasted modern science is that its great teachings full of meaning for daily life are so slowly filtering down from the investigators to even many well-educated people, not to mention the great masses with limited or no formal education. We need a rapid expansion of facilities for the promulgation of scientific knowledge among the people. This means a movement along two lines: first, there should be greater attention paid to science teaching in schools and colleges; and second, there is need of a science extension system reaching out to those who have already passed beyond the direct control of regular educational institutions. In both of these lines science museums have an opportunity for playing an important part. They may be valuable supplementary aids to the science studies in educational institutions, and they may be the people's university of science for the diffusion of scientific knowledge among those not directly reached by teachers.

Now it must be evident to even a superficial observer that in order to be of such educational value, a science museum must be far different from the old-time collection of natural objects arranged systematically. There must be a limited amount of systematic arrangement, for some idea of system is an essential part of scientific education, but the great view of modern science which the general public needs is only in very small part taxonomic. It must, on the contrary, be chiefly a view of science in relation to modern life in its combined intellectual, practical and æsthetic outlook. Therefore a science museum with educational aims must be planned to present the great principles (such as evolution) which make an intellectual appeal; it must teach the applications of science to practical life (that is, germ diseases, economic animals and plants); and it must increase the æsthetic appreciation of nature and nature's processes.

Such are the chief opinions as to the educational functions of a science museum as seen by an outsider who is interested in nature study and general science with reference to popular educational movements. Such views lead to recognizing that museums have two distinct functions, one the scientific work looking toward an increase in the sum total of knowledge, and the other concerned with selecting and diffusing among citizens young and old the main facts and ideas wherein science definitely touches human life. This means that we need either separate museums of two types, or two organizations within one museum. Obviously the latter is the ideal and

economical plan, for numerous specimens may at the same time serve both scientific and educational ends, and the specialists attracted by opportunity for scientific work may also be excellent directors of the educational activities in their own lines.

If I were requested to name a museum which illustrates in its working the above ideas regarding educational functions and organization, I should at once think of the American Museum of Natural History as of far greater value in public education than any other of the great natural history museums of America and Europe. In no other museum have I been able to find so much evidence that the administrative authorities are deeply interested in public educational problems. This is shown in many ways, in four very prominently: First and most strikingly in the immense number of specimens mounted and arranged so as to emphasize the points of greatest interest to the general public. Splendid examples of this are the bird groups, certain groups in the vertebrate palaeontological halls, and the Darwin Hall. Another evidence is shown by the method of labeling. The value of an exhibit depends largely upon explanatory labels. A museum with simply the names on specimens does not deserve to be classed as of noteworthy educational value. The third important evidence is found in the very liberal space allotted to specimens and groups of specimens which are likely to be of popular interest. To reduce the interest of the non-scientific visitor there is nothing so successful as crowding specimens into cases and cases into limited floor space. The few dozen bird groups set prominently in open spaces at the American Museum mean more to the general public than would a very great number of such groups crowded together in order to exhibit a complete ornithological collection. And lastly, the fourth evidence that the American Museum is interested in public education lies in its direct attention to the teachers and students of nature study and biology of the New York City public schools. This would have been considered by an old-time curator as an unpardonable digression from the proper work of a museum.

This development of the American Museum during the past ten years into an efficient educational institution is a matter to which New Yorkers are just awaking. And it would seem that the educational greatness of the Museum has only begun. With coming new buildings and above all with improved transit arrangements which will make the building more readily accessible from all parts of the greater city, the American Museum is sure to develop into full completeness its possibilities as a great educational institution in addition to its function as a scientific one.

CORDIAL RECOGNITION OF THE MUSEUM'S WORK

I. MUSEUM AND HIGH SCHOOL UNITED FOR HEALTH AND ECONOMIC WELFARE

By George W. Hunter

Teacher of Biology in the De Witt Clinton High School

AS a high school teacher of biology I cannot speak with sufficient praise of the work of coöperation already in force between the American Museum and New York City high schools. Our courses in biology have decidedly a civic trend, biology being applied in its relation to human welfare and especially to the welfare of the citizen of New York. The collections then which bear on the health and economic welfare of the nation are the collections which we as high school teachers most use.

The value of the Museum to us is threefold: first, in our study of collections at the Museum; second, in attendance on lectures which fit into our course, and third, in the use of loan collections.

Under the first heading the De Witt Clinton High School plans several trips during the year; one for the general survey of the Animal Kingdom — for this purpose the synoptic collection in the Darwin Hall is used; then a trip to the insect collections for the economic relation of insects, the mosquito models in the Darwin Hall being used for this also. A third very important trip has been worked out for the bird groups which are used to teach the meaning of adaptation.

To a less extent we use the collections of mammals of New York State, the fishes and the Jesup Collection of Woods. One of the greatest aids will come when the new department of hygiene prepares its exhibits. Last year, for example, we visited the Sewerage Commission Exhibit and listened to an admirable lecture on sewage disposal. That kind of coöperation counts much for the making of citizens.

II. THE MUSEUM INCREASINGLY HELPFUL FOR TEN YEARS

By Lillian Belle Sage

Teacher of Biology in the Washington Irving High School

SINCE my connection with the New York City schools in February 1902, we have in various ways used the Museum with relation to the biology work. For two years we arranged a regular course of lectures at the Museum, the Museum authorities giving us the use of the lantern, someone to run it, and the use of some room. So popular did the lectures become that a third year we joined the other high schools of the



Studying the sugar maple in the Forestry Hall. Much of the education of the Museum leads directly to interests in country life

City and had a series of lectures given by officers of the Museum, and the auditorium was crowded. We found however that to listen to a lecture and visit the Museum itself in one day was not satisfactory, so for the past two years we have had each class visit the Museum three times during the year. A teacher always accompanies the class and each pupil before starting out is supplied with a set of questions which are to be answered from observations made there. I find this method most successful for we go directly to work with questions, specimens, note-book and pencil and no time is lost.

Our first-term students visit the Jesup Collection of Woods; those of



PHOTOGRAPHS OF ONE OF THE CIRCULATING SCHOOL CHARTS PLANNED BY THE DEPARTMENT OF PUBLIC HEALTH TO TEACH THE PREVENTION OF INFECTIOUS DISEASES

The explanatory matter of the charts is very simple and non-technical, as the following:

"Many sicknesses, and particularly those which are catching or communicable, are caused by living germs which grow in the body as a mold grows in jelly and make poisons that cause sickness and sometimes death. These germs are harmless-looking things like microscopic sausages, so small that millions might lodge on a pin point; yet they are the cause of tuberculosis, diphtheria, typhoid fever, cholera and many other diseases

"The germs of disease are spread from the sick person or the 'carrier' to the next victim by various means. For example, these girls are doing sums with one pencil, which each in turn without thinking puts into her mouth, so that any disease which either may have will be likely to spread to the other through the transfer of the germs from the mouth"

the second term make two trips, one for insects and a second for birds and comparative work on vertebrate skeletons. The girls write an account of their visit and their papers are discussed in class the day following. It must be said that the collection showing life histories, economic value and relationship of insects could not be improved for the purpose of supplementing our teaching, and that the new frog group is one of the best exhibits in the whole Museum as adapted for correlation with our high school biology.

The Museum has loaned to our school cases of insects, birds and invertebrates, which we have found of great value. A set of pictures, prepared under the direction of Dr. Winslow, was loaned to us last year and we used it with more than six hundred girls. The pictures showed plainly the common carriers of disease and how infectious diseases can be prevented.

In my last visit I brought a blind girl and enough cannot be said of the assistance she received. She gained her first accurate idea of the mammals and birds about which she had read and heard. The Washington Irving biology girls soon get the "Museum habit," for once their attention is directed there, they go often and interest others, especially members of their own family.



"Our own hands are almost as likely to carry disease germs as are those of anyone else, for in the day they touch a hundred things which someone else may have infected. This is why the thorough washing of the hands before eating is so necessary." [From circulating school chart]

III. THE MUSEUM A LABORATORY FOR CLASSES

By Anna M. Clark

Head of Department of Nature Study and Science, The New York Training School for Teachers

THE studies made by our students at the Museum are a very important part of our nature study course. Four class trips at least each year are made for the purpose of studying the invertebrate groups in Darwin Hall and the birds, insects and minerals.

The Museum gives a far broader view than it is possible for students to get from their own outdoor experiences or from such collections as the school provides. A carefully planned museum lesson, calling for the solution of definite problems, affords the benefits usually following any laboratory work.

We have used the Habitat Groups of Birds to show types of bird life in various parts of the world and how birds are adapted to different environments; the insect collections chiefly in connection with the study of economic forms. We have used the collection of precious stones to show forms of unusual beauty in which many common minerals occur, and the collection of New York City rocks and minerals to aid in the identification of such minerals as we ourselves find about the city as well as to supplement our observation work on them.

IV. HOW ONE CROWDED HIGH SCHOOL USES THE MUSEUM¹

By James L. Peabody

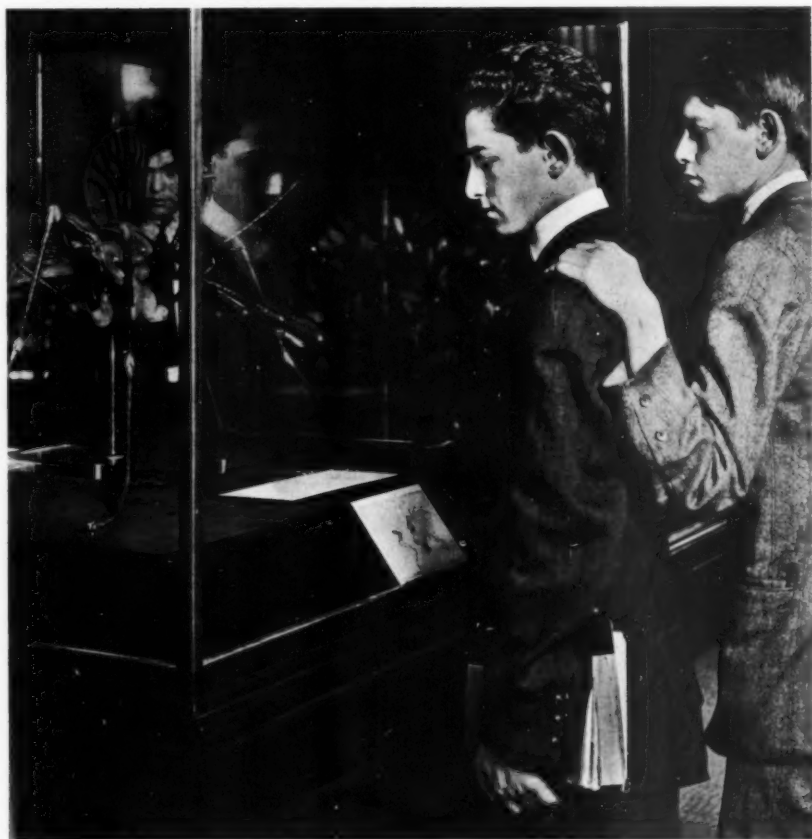
Teacher of Biology in the Morris High School

EVER since the Morris High School was organized in 1897 its biology teachers have found the American Museum a most valuable source of instruction and enjoyment. In the early days before the numbers of students in our classes became so great, most of the teachers of biology went to the Museum with each division of students to study trees, or birds, or insects, or skeletons. Not only did this study supplement the work of classroom instruction, but it also furnished the best of opportunities for the teacher to know personally the boys and girls in his classes.

With the increased complexity in school organization those class trips have become more and more impracticable, and we have therefore set apart two days in each half-year for biological excursions to the American Museum. On Friday of the week devoted to school examinations, the four to five hundred boys and girls in Biology II (Animal and Human Biology) go to the Museum on a special train provided by the Interborough, accompanied by the ten teachers of biology. They assemble in the large lecture hall, where they listen to an illustrated lecture on the characteristics and economic importance of birds with methods of bird protection. A definite study is then made of the bird groups and of the various types of animals in Darwin Hall, the students being guided by an outline which they fill in

¹ Mr. Peabody furnished with this statement of the work of biology classes in the Morris High School, copies of the outlines used and questions to be answered in the Museum lessons on woods, birds and invertebrates. These seem of such practical value and general interest that it is regretted lack of space prevents their publication in the JOURNAL.—The Editor

and file with the teachers on leaving the Museum. At school the next two or more days are devoted to a discussion of the lecture and the observations made of the animal groups. In a similar manner, on Monday of Regents' week, the five to six hundred pupils in Biology I (Plant Biology) meet in the lecture hall and listen to a lecture on "Forests and Forest Preservation." The remainder of the morning is devoted to a study of the Jesup Collection of North American Trees, when the students fill in the blanks of an outline. Certainly the public schools of New York City will do all they can to develop appreciation of the enjoyment and knowledge furnished so prodigally by the world's greatest museum for popular instruction.



Pupils from the High School of Commerce before the malarial mosquito exhibit

In a museum the visitor may seek out that subject in which he is most interested and thus lay a foundation for a life work or recreation

Classes from the High School of Commerce visit the Museum not only for the subject matter of the exhibit but also for a study of methods, the work of glass blower, clay and wax modeler and of other craftsmen in the preparation laboratories

THE AMERICAN MUSEUM AND EDUCATION

A SERIES OF SIX ARTICLES BY MEMBERS OF THE SCIENTIFIC STAFF OF THE
MUSEUM ON CERTAIN PHASES OF THE INSTITUTION'S EQUIPMENT FOR
EDUCATIONAL WORK

I. COÖPERATION WITH THE PUBLIC SCHOOLS

A system of Museum Extension in loan collections and lectures and provision within
the building for expert guidance and instruction of classes

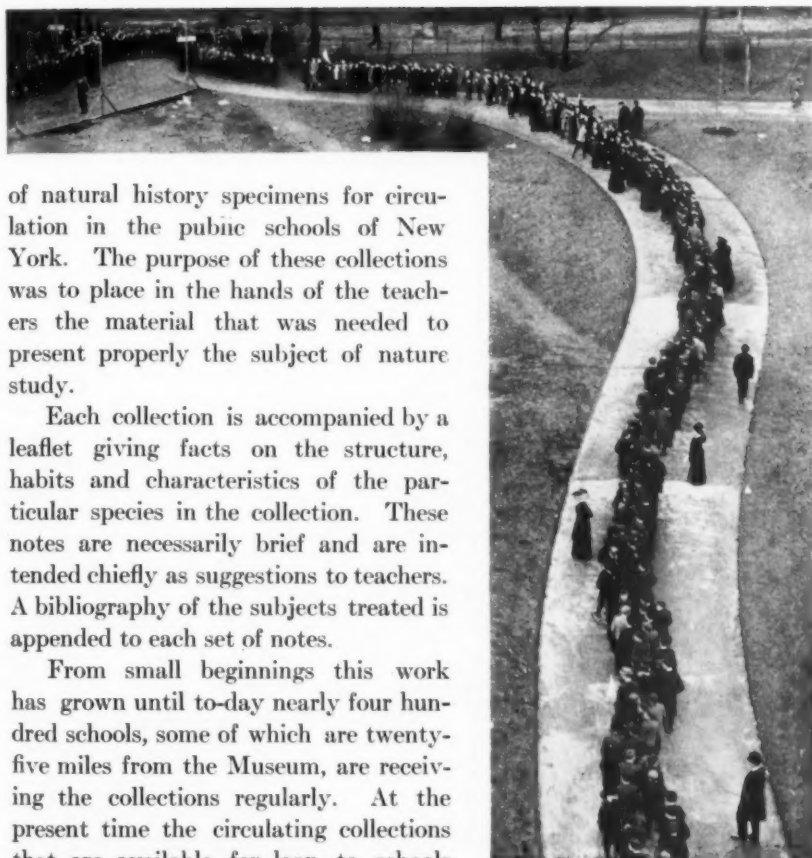
By George H. Sherwood

WHILE education is the fundamental principle underlying all modern museum exhibition and the collections of the American Museum from its foundation have been a source of information to teachers, certain definite steps have been taken within the last ten years to bring about a closer relation between the Museum and the public schools. To carry out this purpose, especial facilities are offered teachers and pupils in order that they may have the freest use possible of the educational material which the Museum possesses.

The introduction of nature study into the courses of study of the public schools, combined with the growing general interest in out-of-door life, has given the Museum an opportunity through its circulating collections to become of much practical use to the teachers.

Using as a guide the syllabus of nature study issued by the Board of Education, the Museum prepared some years ago several hundred collections





of natural history specimens for circulation in the public schools of New York. The purpose of these collections was to place in the hands of the teachers the material that was needed to present properly the subject of nature study.

Each collection is accompanied by a leaflet giving facts on the structure, habits and characteristics of the particular species in the collection. These notes are necessarily brief and are intended chiefly as suggestions to teachers. A bibliography of the subjects treated is appended to each set of notes.

From small beginnings this work has grown until to-day nearly four hundred schools, some of which are twenty-five miles from the Museum, are receiving the collections regularly. At the present time the circulating collections that are available for loan to schools and the grades to which each is adapted are as follows:

Schools to visit a special exhibit at the Museum

Native Birds. Adapted for Grades 1A-4B

Owl Set — Containing owl, chickadee, nuthatch, song sparrow, kinglet

Blue Jay Set — Containing blue jay, woodpecker, crossbill, junco, English sparrow

Robin Set — Containing robin, red-winged blackbird, oriole, meadow-lark, chipping sparrow

Bluebird Set — Containing bluebird, phoebe, barn swallow, house wren, chimney swift

Tanager Set — Containing scarlet tanager, red-eyed vireo, goldfinch, hummingbird, pigeon

Insects. Adapted for Grades 2A-5A

Containing cynthia and cecropia moths, monarch butterfly, etc., and typical representatives of the different groups of insects

Special Insects. Adapted for Grades 2A-5A

Containing life history of cecropia moth, development of monarch butterfly, life and work of honey-bee and household insects

Mollusks. Adapted for Grades 4A-5A

Containing shells of about twenty-five mollusks, including specimens of the oyster clam and chambered nautilus

Crabs. Adapted for Grade 5A

Containing relatives of the common blue crabs

Starfishes and Worms. Adapted for Grades 4A and 5A

Containing typical species of the two groups

Sponges and Corals. Adapted for Grades 4A and 5A

Containing about fifteen species of corals and their relatives

Minerals and Rocks. Adapted for Grades 3B and 4A

Containing twenty specimens of minerals and building stones.

Native Woods. Adapted for Grades 2A and 5B

Containing elm, hickory, oak, maple, white birch, ailantus, sweet-gum, sour-gum, chestnut, sycamore. Specimens show cross, longitudinal and oblique sections of the wood, characteristic bark, annual rings, etc.

The method by which the teacher obtains the collections has been made as simple as possible. The Museum furnishes blanks upon which principals make application for the collections and at the same time indicate the sequence desired. Delivery is then made by the Museum messengers who call again at the end of the loan period, i. e. every three or four weeks, and make the second delivery. The wisdom of making these collections loans instead of gifts has been repeatedly demonstrated. This method keeps the Museum in frequent touch with the teachers and enables us to understand their needs better.

It is of course at the Museum that we are prepared to extend more varied aid to the teachers. To facilitate the work of reaching the Museum, the Museum in coöperation with its sister institutions of the city, has issued a large map of New York City showing the locations of free educational institutions and the main transportation routes by which they are reached. A copy of this map has been presented by the contributing institutions to every public school in the city and its examination will simplify the task of visiting the Museum.

By making an appointment a few days prior to the visit to the Museum an instructor will be provided who will guide the teacher and her pupils through the halls, calling attention to the lessons taught by the exhibits. Such visits may also be arranged in series to supplement classroom work and may be preceded or followed with lectures by the instructor on the subject under study. Through the aid of the instructor classes are enabled to make the best use of the time spent at the Museum.

In some instances teachers prefer to give their pupils special talks or lectures. For this purpose the Museum has several small classrooms equipped with chairs, tables, blackboards and stereopticon which will be reserved on request. In one of these rooms a teacher would be as much undisturbed as in her regular schoolroom.

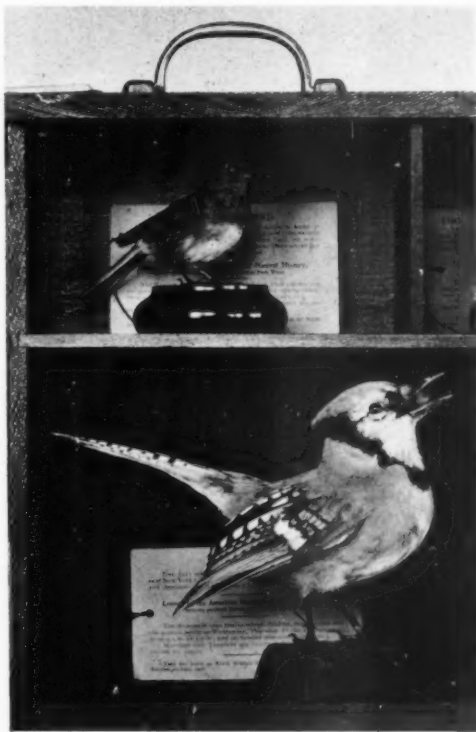
The Museum possesses more than thirty-five thousand lantern slides, of which about twelve thousand are colored. The field parties which the Museum is sending to remote parts of the earth bring back photographic

material, which enables us to make continual additions to this series of slides. The views illustrate plant life, animal life, industries, customs of people, and physical geography. While these slides cannot be loaned for use outside the building, teachers may select slides to illustrate a desired lecture which may be delivered in one of the Museum's classrooms.

It is from this source of supply that we draw the material to illustrate the informal lectures which are given to school children. These courses were first suggested by the New York City Teachers' Association in 1904. Since that time they have been given regularly in the spring and fall. The subjects are chosen with especial reference to the courses of study given in the syllabuses for history, geography or nature study, and are designed to supplement the classroom work of the teachers. Announcements of our courses of lectures are mailed to principals, and teachers file reservations for seats in the Auditorium on blanks furnished by the Museum.

The broad scope of the educational work of the Museum is indicated in the action of the Trustees in recently authorizing the equipment of a room especially reserved for the use of the blind. As yet only a small beginning has been made, but specimens of animals and Indian implements have already been set aside and labeled in raised type. The development of this feature of the Museum's activity has been amply provided for through the bequest of Phebe Anna Thorne and the generosity of her executors, who have endowed the work as a memorial to Jonathan Thorne.

It is safe to say that no visitors to the Museum obtain a greater enjoyment from the collections than do the various groups of blind people, who may often be seen in the exhibition halls.



Two compartments of a traveling case showing junco and blue jay on their way to the children of some primary school. The Museum has prepared several hundred traveling cases of birds

II. FOSSIL VERTEBRATES — WHAT THEY TEACH

By W. D. Matthew

"The plan of the department [of Vertebrate Palaeontology] as outlined by Professor Osborn in the Annual Report for 1892, was to...present a historical development of the Evolution of the Mammals in North America. It was expanded subsequently to cover the evolution of the vertebrata in general, but its chief aim...has been to present the Evolution of the Land Vertebrates, primarily of North America, but incidentally of other parts of the world." Extract from the *History, Plan and Scope of the American Museum of Natural History*

THE history of vertebrate life in North America: this is the fundamental concept in the exhibits of fossil vertebrates which occupy three great halls on the fourth floor, east wing, of the Museum.

Palaeontology, it has been said, is but history writ large. It is the history not merely of man, but of all life, projected backward into a dim past whose distance dwarfs to insignificance the few centuries of recorded human events. In the history of mankind the modern view no longer regards it as a mere chronicle of successive events and disconnected episodes, but seeks to trace the orderly and continuous development of primitive races and conditions into the complex and elaborate civilizations of the present day. The rise and fall of dynasties and kingdoms, the progress and decline of races, their migrations and interaction on each other, the qualities of mind and body and conditions of circumstance and environment which bring about the sequence of historical events, all play their part both as cause and effect, and each event is considered in relation to the causes which preceded and the effects which followed it.

So too in this larger history which traces the orderly development of life through the vast periods of geologic time. The continuity of life, and its evolution under the impulse and control of natural law from primitive beginnings to its present variety and complexity — the doctrine of evolution in its broader sense — is the keynote of modern palaeontology.

In a historical museum we expect to find the documents, or some of them, on which history is based. Some of the more important are on exhibition, arranged and labeled so as to show what they mean. Most of the records and documents are preserved in storage, catalogued and arranged and made accessible to students. So with the documents of palaeontology, the fossil skeletons, teeth and bones which record the former existence of animals now extinct, and the earlier history of the races which now people the earth. The more important specimens are placed on exhibition and are provided with labels and diagrams. The great mass of the material is in storage, accessible to scientific students.

The three large halls devoted to fossil vertebrates represent in a broad way successive geologic eras as marked out by their dominant forms of life. In the central hall are placed the mammoth and mastodon, the great ground sloths and other extinct giants of the Age of Man, with whom our prehistoric ancestors disputed the dominion of the earth.

To the east is the Tertiary Mammal Hall showing the evolution of the different races of modern quadrupeds during the Age of Mammals, before man had emerged from the obscurity of his pre-human existence. Here in successive alcoves are palæontological "documents" which illustrate the past history of the different kinds of modern mammals, as interpreted and explained by labels and diagrams.

By far the most complete of these exhibits is the alcove showing the Ancestry of the Horse. In other alcoves are illustrations of the geologic history of the camel and other ruminants, of rhinoceroses, tapirs and carnivora, and at the farther end are shown such episodes in the Tertiary history of North America as the rise and fall of the *Uintatheres* and *Titanotheres*, dynasties of extinct giant races which have left no living descendants. But in a broad way the Tertiary Mammal Hall shows the evolution of the higher quadrupeds, the building up of the animal world of to-day.

In the Dinosaur Hall we pass into an older world. As in a museum of antiquities we may pass from the halls devoted to the records of the up-building of our modern civilization into those displaying the relics of an older civilization upon whose ruins it is built, so here we pass from the Age of Mammals into the Age of Reptiles, the era of the dinosaurs — gigantic extinct reptiles which were the dominant land animals of that far distant time. They are but remotely related to the living lizards, crocodiles, snakes and turtles, poor and unassuming cousins who have survived the downfall of the giant reptilian lords of the Mesozoic world, and continue even to-day to play their modest part in the economy of nature. The unfamiliar and bizarre proportions and often gigantic size of these Dinosaurs make them the most interesting and impressive of all extinct animals. As yet, their history is imperfectly known, and neither the materials nor the space allotted for their display permit us to show the successive stages in the evolution of the different dinosaurian races. In the far corner of the Dinosaur Hall are the records, still less complete, of a more ancient period, the Age of Amphibians, which preceded the Age of Reptiles; and in the small southeast Tower Hall are the relics of the Age of Fishes which in turn precedes the Age of Amphibians.

With the building of the projected extensions of this wing of the Museum the space allotted to these older periods of earth history will be expanded, so that the visitor will see displayed in successive halls the records of the Age of Fishes, the Age of Amphibians and Coal plants, the earlier and later periods of Dinosaur supremacy, and then, passing through the Evolution of the Mammals, will finally reach the Age of Man in the central hall. The materials for filling these successive halls are rapidly accumulating through the efforts of successive expeditions financed by the President and Trustees of the Museum.

III. THE HABITAT GROUPS OF MAMMALS AND BIRDS

By J. A. Allen

THE group exhibits illustrating the life habits and natural environment of mammals and birds in the American Museum of Natural History now exceed one hundred and fifty in number, and nearly half of them, in respect to scope, size and accuracy of detail, are admittedly more elaborate than any similar exhibits in other museums. The construction of the smaller groups began some twenty-five years ago, and later much larger groups were undertaken. In more recent years similar exhibits have been installed in other American museums, making a more or less general departure from the century-old methods of museum exhibition that prevailed generally almost to the end of the nineteenth century.



The educational advantages of these groups consist in their realism. The Bison Group, with its area of fifteen by thirty feet, represents a characteristic bit of the Plains, the former typical home of the American bison (miscalled "buffalo"), and includes not only the original sod covered with real "buffalo grass," but also a real buffalo trail, a weathered bison skull, and bunches of cacti, besides an old bull and cow, a young calf and young bulls of different ages, the ensemble illustrating most impressively and accurately the actual appearance of this animal and its home surroundings. Large explanatory labels give briefly its history, while on accompanying maps is shown the vast area of its original range and the gradual restriction of this range to the few points where it still exists, in limited preserves under governmental protection.



The Museum provides instructors to guide teachers and classes, explaining at request exhibits that correlate with classroom work

The Moose Group, on a similar scale and with equal detail and realism, illustrates the life history of the largest game animal of America, with its entirely different habits and haunts. The elk, the Barren Ground caribou of the Alaskan Peninsula, the musk ox of Arctic America, the white sheep of the northern Rockies, the Atlantic walrus and the Alaska fur seal, are each placed before the visitor in a way to illustrate impressively their habits and the conditions under which they live. All of the mammals characteristic of New York State, except the field mice, shrews and bats, are similarly illustrated, so that the children of New York City have thus the opportunity to see and become in a way familiar with the principal mammals of New York, many of which they would never see in life, and of none of which would they ever be able to obtain more than fleeting glimpses in a state of nature.

The bird groups, with their panoramic backgrounds and elaborate treatment, now occupying the entire gallery of the north wing of the Museum, possess an educational value not easily overestimated, illustrating as they do the principal types of North American bird life in a way to bring vividly before the visitor not only the habits and haunts of the species represented, but also the types of country they inhabit. They are

thus highly educational from the standpoint of geography and climate, as well as eminently pleasing aesthetically. The accompanying descriptive labels supply the necessary information to render the groups easily understood.

The interest and value of this visual instruction to the children of the schools is best appreciated by witnessing the avidity with which they scan these elaborately presented glimpses of bird and mammal life, these bits of nature transferred to the museum where they may be studied in detail and at leisure.

IV. EDUCATIONAL AIMS OF THE DEPARTMENT OF INVERTEBRATE ZOÖLOGY

By Henry E. Crampton

THE student of living nature invariably becomes acquainted at first with the larger animals, those possessing a backbone, such as the beasts of the field and forest, the birds of the air, and aquatic forms like fishes and amphibia. Not until later is his attention challenged by the myriads of smaller animals devoid of backbones, and hence called invertebrates; only a few kinds of insects, crustacea and edible mollusks come to notice without being sought in their natural homes. Yet many of them are related to man in such ways that his health and welfare depend upon a knowledge of their habits and life histories and moreover, from the educational standpoint, the value of their study is extraordinarily high because their forms are more varied than those of vertebrates.

It is the task of the Department of Invertebrate Zoölogy to display characteristic examples chosen from the wide array known to science, and also to demonstrate the countless ways in which the lives of these low forms are intertwined with other animal life and directly touch human interests.

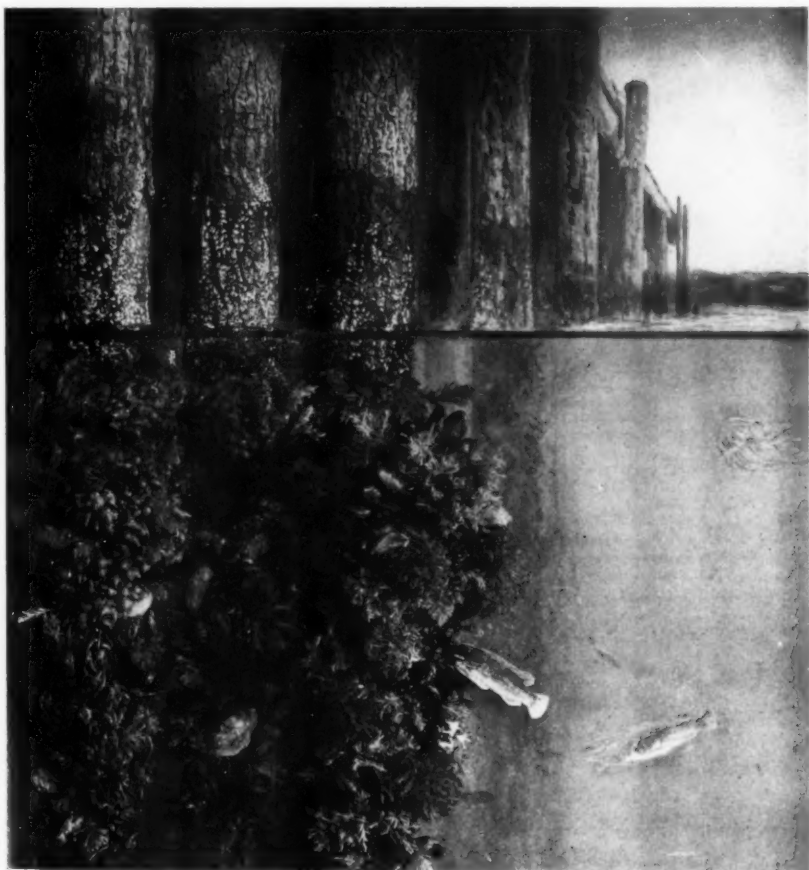
In addition, an insight into nature's all-inclusive process of evolution is so valuable that this too must be presented in educational exhibits of the relationships of animals to one another and to their surroundings as well.

In the Darwin Hall, specimens and models illustrating significant forms among the principal groups of the Animal Kingdom are arranged in the order of their relationship from the



A hive of live bees in the Insect Hall

lowest to the highest. Many of these forms are so minute in life that a glass or wax model must be made with a magnification of more than a thousand diameters in order to show the delicately beautiful structures. To make these systematically arranged specimens upon the shelves more instructive, correlated groups are planned—some have been constructed and others are in progress of construction—to show how the animals really live, how worms burrow in the sand and mud along the ocean's shores, how crabs and starfish meet their conditions of life (Cold Spring Harbor Group) and how swarms and clusters of lower animals crowd upon the piles of a wharf. While in the center of the hall are groups that illustrate greater principles of science and wider biological relations—for

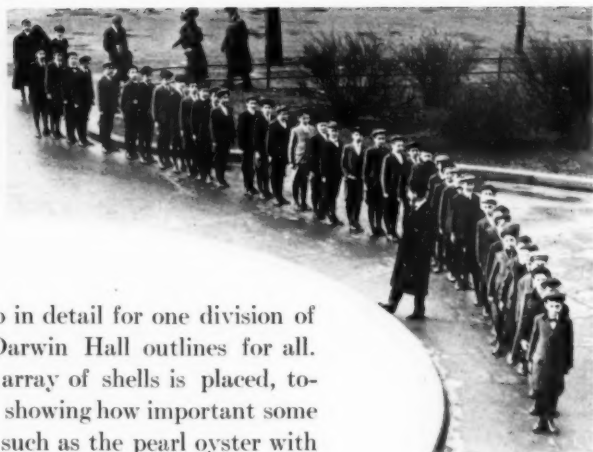


Model for a new group to show the plants and animals that live at different depths in the sea gardens about old wharves. Such a group teaches many facts and principles of biology

instance, a field mouse with its enemies on the one hand and its prey on the other — is an example of the struggle for existence.

The Hall of Mollusca aims to do in detail for one division of animals what the Darwin Hall outlines for all. Here an extensive array of shells is placed, together with exhibits showing how important some species are to man, such as the pearl oyster with its pearl-fishing industry, and the common oyster and the clam with their culture and industries.

The Hall of Insect Biology and Local Insects has a double function. In it are deposited larger collections of insects found within fifty miles of New York so that a student can bring his own collections for comparison and identification. Here, as in the Darwin Hall, larger principles are demonstrated, such as variation of the members of a single species, the differences between insects of forests and of plains, the results of experimental investigation of heredity, and the like. During the past summer there have been in the hall special exhibits of the seventeen-year cicada and of live bees at work in a hive.



V. THE MUSEUM LIBRARY

By Ralph W. Tower

THE Library of the American Museum has been in existence since the founding of the institution but not until very recent times has it kept pace with other departments. During the last decade however, enthusiasm has increased, some scientific societies have deposited their books in the Museum's custody and altogether a serious attempt has been made to make this library one of the most comprehensive and complete of its kind in America.

Library progress in general has been very rapid in America in recent years and one of the most important developments in this progress has been the rise and growth of the "special library," particularly the one whose purpose it is to serve the public in a free and unrestricted manner.

A special library relating to natural history appeals not only to the specialist whose needs demand accurate and detailed descriptions but also to a very large proportion of the public where the desire is for more general

information; for very frequently has the business man, the professional man, the man of leisure, the artist, the inquiring youth found the keenest enjoyment and relaxation in gaining expert knowledge on some subject in natural history. And where would he rather find a well-equipped library in this domain than in a large public museum supplied both with the specimens and with the literature pertaining to these specimens.

In the Museum's library of 60,000 volumes are some 15,000 volumes devoted to zoölogy, containing the works of Audubon, Gould and Chapman in ornithology, an excellent collection of 3500 volumes relating to insects, and a 2000 volume collection in conchology embracing the classics of Küster, Reeve and Binney. There is also a well-selected library of 2500 volumes in anthropology containing many of the rare and older works relating to the North American Indians; an excellent collection of 3000 volumes in geology, enriched by the library of the late Professor Marcou; a collection of 5000 volumes in palæontology to a large extent composed of the Osborn Library of Vertebrate Palæontology, and besides, an unusual collection of more than 20,000 volumes of natural science periodicals.

It is doubtful if the educational value of a free special library of this kind can be overestimated. In few other fields is it possible to bring together the material subject and the literature as under the roof and administration of a great natural history museum.



Describing catalpa flowers (wax reproduction) in the Forestry Hall

A natural history museum presents the combination of laboratories filled with material for study and a library covering the literature of this material

VI. THE ARRANGEMENT OF EXHIBITS IN THE HALLS OF ANTHROPOLOGY

By Clark Wissler

IT is fitting that a natural history museum should show something as to the natural history of man and in accordance the anthropological halls of the Museum exhibit samples of handiwork illustrating, as we say, the cultures of the less civilized races. We fear however that few who visit our halls really understand the principle upon which the specimens are arranged. If you ask one what any of our biological halls represents the answer is as instantaneous as a reflex — evolution. If you ask a biologist what an anthropological hall should indicate you receive the same answer — the evolution of man and his culture. Yet, if you ask the anthropologist he is somewhat at a loss for a definite term or phrase to express the idea, for while the whole biological world is almost unanimous that evolution is for it the one working hypothesis, the anthropologists of Europe and America are by no means agreed except in that the origin and historical development of culture is the fundamental problem. Animal life is the biologist's problem until that life takes the shape of man whence the classification becomes the anthropologist's problem. Since with the exception of a few very ancient skeletons however, all men seem to constitute a single biological species and cannot readily be arranged in a series of descent according to ancestry, the chief interest of anthropologists has been in habits and customs, or culture. While most museum anthropologists will agree that exhibits should be so ordered as to show the origin and historical development of culture, they are confronted with no generally accepted theory of development according to which museum material could be arranged. Hence they all fall back upon a geographical scheme of classification.

As our halls now stand we have on the ground floor five of the great culture areas of the American Indians — the Eskimo, the North Pacific Coast, the Eastern Woodland, the Great Plains and the Southwest. On other floors are halls for Asia, Africa, the South Seas and South America. The ancient races are represented in the Mexican and general archæological halls. Such an arrangement has this virtue, it presents man in approximately the time and place relation he really occupied at the date of observation.

Many of our visitors, especially teachers of children, are interested in the developmental sequences, such as methods of fire-making, house construction, and stone and metal work. On all such points illustrative material will readily be found in the various collections. If one is interested in houses, many types will be found in the exhibits for the different geographical areas. If one wishes to formulate a theory as to how the various types

develop, he is at liberty to do so and will not find his flight impeded for lack of insight into the true relation of things, for should a museum officer decide this point for himself and select out all the house models for exhibition in a single hall, arranging them according to his notion, the visitor could not see each type in its proper cultural setting. The point however is this: scarcely any two anthropologists are agreed upon any one of such sequences and until they are, or until the facts available make a definite conclusion inevitable, it is impossible to have other than a geographical arrangement in our exhibition halls. There are, of course, some very fundamental problems now occupying the minds of anthropologists, but their working hypothesis is a geographical classification of cultures rather than an evolutionary hypothesis.

The general cultural value of such comparative studies as methods of fire-making and house types is obvious. In the case of fire-making, we have real historical data on the evolution of matches, and know that they were preceded by flint and steel and wood friction. We are not quite sure that wood friction was first, but think it safe to assume as much. Beyond this we cannot go, but we feel that the child who sees the various methods demonstrated in school and sees real specimens in museum collections, is likely to grasp some fundamental principles of practical life as well as the significance of certain physical and chemical conceptions. The same is true of house types, canoe types, hatchet types, food types, and every other phase of culture.



A SYMPOSIUM OF EXPRESSIONS FROM PRIMARY AND GRAMMAR SCHOOLS

THE following quotations representing a few of the many letters received from principals and teachers of the Public Schools can but make the Museum humble before the vastness of its opportunity, the far reaching of even the smallest effort put forth, and again proud that the American Museum was the institution to which came the rare fortune of developing the working system of coöperation with the schools.

The Museum holds an unusual opportunity as providing free and pleasurable instruction in the heart of New York. Moreover, it is an insti-

tution untrammelled by courses and requirements, or rather it has all courses elective so that the child may seek out that subject in which he is most interested to lay unconsciously the foundations of a life work or recreation. For feeling and intellect act together in the child and the more spontaneous the interest the more deep-rooted and lasting the impression. Thus it is gratifying to see in the letters from the schools frequent reference to the liking that children have for the collections and the trips to the Museum.

It is good also to find many allusions to the fact that children carry home the news of their experiences and bring their parents "to see the Museum" too. This unites the younger and the older generations by a tie of common knowledge and interest.

Two features of the institution's educational work are peculiar to a museum and due to its organization: first, that it furnishes pleasurable instruction which is non-compulsory as to time and subject, being moreover important as knowledge toward better living; and second, that it furnishes such education to young and old *together*, thus forming one small bond for united family life under city conditions where there is great need of such influence.

THE MUSEUM HAS JUSTIFIED ALL ITS COST BY WHAT IT DOES FOR CHILDREN OF ELEMENTARY SCHOOLS

Public School No. 50, Manhattan

I have not seen equalled in any European country the hospitality with which the Museum has opened its doors to the children, providing guides to escort them through the building. The children have been intelligent and eager listeners to the lectures, and have always returned to school the following day enthusiastic over their experience, which provided an outing for many whose lives are not often gladdened, while affording instruction as well as rare pleasure.

It has been the good fortune of Public School No. 50 to have lecturers like Mr. Sherwood and Mrs. Roesler come to the children in their own school and show them, from specimens sent by the Museum, the characteristics of many birds whose notes they reproduced to the great pleasure of the children. It is a "red-letter day" in Public School No. 50 when a new case of specimens arrives and is exhibited to the children.

We feel that the Museum would have justified all that it has cost if it were only for what it does for the children of the elementary schools.

A SINGLE CHERRY FLOWER

Public School No. 36, Brooklyn, Grade 3B

The flowers and twigs distributed by the American Museum of Natural History last spring were of great interest to the children. A bud on one of the cherry twigs opened in my classroom, and the children, who had never seen a cherry blossom, were delighted to see and smell the little white flower.

THE BIRD COLLECTIONS A REAL ENJOYMENT

Public School No. 113, Manhattan

I do not know how we ever had any bird study down in this section of the city before the Museum began to lend us the collections of birds. Now we have not only the study of the birds but the children draw them in color, thus doubling the enjoyment. I keep the birds near my office door and no child passes without giving a good long look in their direction.



Editorial note.—Lack of space in the JOURNAL has postponed the publication of many interesting letters sent by school children. Who could speak of the Museum's help with a meaning less obscure than in the following:

"Last month I was down to see the Natural Museum History for the tenth time. I was very glad I went, because when my teacher ask to describe a insect, bird or anything I could stand up and answer all her questions correctly. When the class was tested I received a hundred per cent paper.

I can assure you if anybody who is interested or wants to learn nature to go down to the Natural Museum History"

VISITING THE MUSEUM ON A HOLIDAY

O Columbus Day boys came on their skates long distances to see the picture of Columbus. Some of these photographed came from 169th Street, East Side, Public School No. 2, and from 146th Street, Public School No. 186



Photo by George Gade

Bird houses made by boys of Public School No. 5, The Bronx, on the basis of collections sent by the Museum

MUSEUM HELPS BOYS TO MAKE BIRD HOUSES

Public School No. 5, The Bronx

The collections of birds that the Museum sends out to the public schools have proved very helpful in the matter of furnishing concrete evidence of the size of birds the boys of Public School 5, The Bronx, decided to build houses for.

The school has always made much of Audubon's birthday, which comes about the same time of the year as does Arbor Day, and the pupils have taken a lively interest in the fate of the birds that used to be so numerous about the Bronx. Therefore when it was suggested that the boys make bird houses to put up in the yards to coax back some of the wanderers, the notion was taken up enthusiastically. The teacher of constructive work in the upper grades sent for the collections of birds as they came to the school and allowed the boys to judge of the size and appropriateness of the houses for the various birds. They read in suggested books about the kinds of birds that lived in artificial abodes and searched everywhere for facts concerning the nature of their habitat. It was in accordance with these ideas that they built the houses, save that in some the more ambitious put glass windows in the hope that they might be able to observe the birds actually at work building or brooding.

For the most part the houses were made in hours out of school and with tools of the pupil's own. The school, not being provided with a shop, was ill-equipped for the furtherance of any very elaborate work, but the untiring zeal of the instructor made the boys eager to work. The results proved to be extremely creditable and boys that had heretofore shown not much evidence of constructive ability, when once they were launched on this lively problem with a definite, concrete goal, developed remarkable skill and ingenuity. Also it must be said that there came from the work as well a moral development of which there was good reason to be proud.

THE JESUP COLLECTION A STIMULUS FOR WOOD COLLECTIONS MADE BY BOYS

Public School No. 150, Brooklyn

The children are told of things in nature but rarely have the opportunity of seeing them except through the collections. The class of 5A boys were interested in examining the different woods at the Museum. One boy made a collection of hard woods, which the other boys take great pleasure in studying.

THE MOUNTED BIRD MEANS MUCH IN THE IMAGINATION OF THE CITY CHILD

Public School No. 76, Manhattan, Grade 2B

These little people of the second grade, brought up under the abnormal conditions of the city, love the life of the collection. They smooth and pet them, and even kiss them when I am not watching.

THE MUSEUM GIVES CHILDREN A GREATER LOVE FOR LIVING ANIMALS

Public School No. 76, Manhattan

As our pupils live within walking distance of the Museum, they go there frequently. The great attraction for the boys are the wonderful Indian collections. For class use the bi-

collections are prime favorites. All our teachers tell me of the pleasure it gives their children to be permitted to touch these specimens carefully and tenderly.

The members of one class of 4B boys were very enthusiastic over the skeleton of Jumbo. This enthusiasm, as usual, found expression in greater love for the living animal, for we learned while a class was planting seed that one little boy had gone to the park during his luncheon hour and planted some seed near the elephants' house.

CHILDREN REMEMBER WHAT THEY LEARN AT THE MUSEUM

Public School No. 25, Manhattan

The knowledge obtained both from the collections sent us and the lectures given at the Museum means much more to the children than that obtained from books. The information is so definite and interesting that it creates a strong and lasting impression upon the minds of the children, and they are thus able to retain it very effectually.

A LETTER TO MAKE THE MUSEUM DESIRE TO DO STILL MORE FOR THE SCHOOLS

Public School No. 84, Brooklyn

Many of our pupils are children who never see the country and who are totally unacquainted with any birds or insects found outside of the crowded city streets. The specimens enable these children to form correct conceptions of otherwise fabulous creatures.

In their own way the children show quite as much appreciation as their teachers. The first question they invariably ask is, "Is it real?" When assured upon this point they are always deeply interested, and very anxious to "feel how soft the bird's coat is!" Each new interest endures as a helpful foundation for further work. Allusions to any subject studied with the help of Museum specimens bring an immediate and intelligent response.

THIRTY-SIX MUSEUM LECTURES ATTENDED

Public School No. 184, Manhattan

Our higher classes have attended thirty-six lectures which helped to fix the grade work, were an entertainment and brought out a pleasant attitude toward their work. Among the favorite lectures were "From Pole to Pole," "Early Days in New York," "Natural Resources of the United States," and "Life among the Indians." These afforded material for geography, history, nature study and language work.

WORD FROM A DISTANT SCHOOL

Public School No. 59, Brooklyn

My school is located at so great a distance from the Museum that it is not possible to send classes there because of the carfare involved. Thus my teachers and I welcome the collections sent to the school, and the children are always delighted to see the boxes and to study their contents.

THE CHILDREN OF "LITTLE ITALY OF THE WEST SIDE"

Industrial School No. 5

When the Museum of Natural History was brought down to Industrial School No. 5, in the shape of suitable collections in sequence for study, it was a good thing for the children of "Little Italy of the West Side," who live so far down town, near Sullivan, MacDougal and West Houston Streets, that they have little opportunity to go to the Museum.

The children like the birds especially and it is remarkable the aptitude with which they learn to know them. The humming bird is a great delight and the solemn owls are studied with round-eyed wonder. Three classes were taken to the Museum last term. Their experiences are always related at home to the other members of the family, and in this way the benefit is far reaching.

SPRING AND FALL FLOWERS

Public School No. 36, Manhattan

The spring and fall flowers distributed at the Museum are a great help to us, for we find it difficult to obtain the specimens required by the course in nature study. I am sure that this voices the sentiment of all the teachers.

PLEASURABLE STUDY

Public School No. 27, Manhattan

The children, even of the higher grades, like the bird collections best of all. A robin collection was sent to a fifth year class. The teacher glanced at the label and said, "Oh, those are birds; they are for the lower grade. Take them downstairs." A boy immediately raised his hand and said, "Can't we study them before they go down?"

In one of the collections is a parrot. It was the children's favorite. One boy in particular took a special interest in Polly. This boy one day offered to stay after three and put chalk and board rubbers away. Later it was found that his motive in staying was not to help his teacher. He wanted the chance to stroke the bird and talk to it. When the time came for Polly to return to the Museum this boy found he could no longer stay in after three.

Trips to the Museum are always looked forward to with pleasure and the children gain knowledge unconsciously. The classes are large, so that a teacher often has to ask some to wait until another time. But it is likely that when those chosen to go reach the Museum, the "not invited" members of the class are there before them and all must be taken under the teacher's guidance.

THE SCHOOL CHILDREN OF NEW YORK HELP THE MUSEUM TO A GREATER USEFULNESS

Public School No. 10, Manhattan

Many of the children know not even of the existence of such a place until they have accompanied their teacher to view some exhibit. Their delight then sends them home to tell parents and friends of their wonderful "find," and again and again they visit the enchanted ground with varying groups of acquaintances. So in their childish way, by making the Museum known to the greater mass of the citizens of New York, they help it to a greater and ever widening realization of its usefulness.

THE CHILDREN'S ROOM OF THE MUSEUM

By Agnes Roesler

THE Children's Room was started in response to the needs and demands of young visitors to the Museum. The original equipment was slight. A few specimens of birds and small mammals, some books, plants, an aquarium and a case containing live snakes constituted the entire material. The children flocked into the room, looked at the picture books, drew portraits of the birds and mammals and asked questions to their hearts' content.

At different seasons of the year temporary exhibits were placed on view. A jar containing mosquito culture was the subject of many talks; frogs and their eggs were collected by some of the boys and formed the subject of an interesting lecture given by a boy of thirteen years. A lecture on Indians is frequently given and illustrated by some of the youngsters dressed in

"real Indian" costumes. The actors bring water-color paints to decorate their faces, and they play their parts with bashful earnestness. Sometimes little figures of animals or miniature Eskimo villages are modeled in composite clay, the sculptors first making a visit to the Eskimo Hall to examine the construction of igloos. To some of the older children are handed lists of questions to which answers must be deduced from observation of the Museum exhibits.

It is now estimated that there are between four and five thousand youthful visitors in the Children's Room during the year. A small group of children comes every Wednesday afternoon, with sufficient regularity to enable us to carry on study further than desultory questions and answers. Among

other activities we read *Swiss Family Robinson* last winter, and investigated every animal mentioned in that remarkable book. A chance remark disclosed the fact that one of these children was "afraid" of spiders, so we set to work to learn all that we could about spiders and to transmute fear into interest. The same course was followed with regard to snakes, and the children handled garter snakes and other harmless species without dread.

The Children's Room is now being fitted out more in accordance with the original plans and is taking shape as a small museum where opportunity is given for carrying on some activity in addition to observation. Permanent exhibits of shells and minerals and one of wonderful fishes are displayed there. Two cases contain a collection of dolls from all over the world, dolls that were made and played with by Eskimo, Indian and Philippine children, and even some that have come to us from a distant past hidden in the graves of ancient Peru.





Teacher and class at the Museum. "The fruit of the Museum's influence often appears months afterward in some reading lesson or conversation"

TUESDAY AT THE MUSEUM

By Mary B. C. Byrne

Primary Teacher, Public School No. 9, The Bronx

WHEN I came away from the American Museum of Natural History, Tuesday, I carried with me a sense of that institution's efficient service to the children of our greater city; and with an army of other teachers, I am grateful for the inspiring message which the Museum daily speaks to New York City's children through us their primary teachers. The work is of very tangible assistance to teacher, pupil and home.

Looking over the suggestive topics in the *Course of Study for the Elementary Schools of the City of New York*, the teacher of fifth year nature comes upon such large-looming headings as "Adaptation to Environment" and "Elementary Classification" and she asks herself, "How can I teach 'adaptation to environment' when there is nothing at hand, save a stray fly or English sparrow?" "How shall I teach 'elementary classification' when there is no illustrative material, save such forms of life as are found on the city's asphalt pavements or within the brick walls of the nearby apartment houses or factories?"

In answer to this problem comes the temptation to fall back on the time-honored textbook methods, but conscious of the delusion of isolated fact-learning, she answers her first question by asking a second: "What gain shall come to Dominick Guantomasi, or to Moses Rozansky, or to Patrick Sweeney, even though they do master such terms with definitions as 'amphibians, mollusks, crustaceans,' and all the rest?" It is in this definite and puzzling situation that the Museum comes forward with help.

Although pictures, lantern-slides, and concretely worded descriptions serve their purpose, nevertheless in all true nature teaching, the child should be brought into actual contact with the objects studied. This is simply because the power gained through this actual observation enables the pupil afterward to represent to himself these objects and others presented by oral description and home-reading. And so I would say that the Museum's classroom collections give content to the stories, fables, songs and other literature that the schools put into the hands of the City's children.

The Museum fills however a vastly wider field of usefulness in exhibiting within the Museum walls life forms in their natural environments. For every nature teacher knows emphasis should be placed at all times on plants and animals as living things and the true primary nature teacher is always conscious of her larger aim, to put herself and her pupils in loving touch with Nature. No easy task this, when the path of both teacher and child runs over the barren floor of the city-desert. Nevertheless, hidden by piled up apartment houses, office buildings and factories lie the City park and the City museum, each an educational oasis.

No one can doubt the inspiration and breadth of concept that comes when the teacher and class make an occasional visit to the Museum. Whether it be protective resemblance as shown by a weasel in winter or the clever adaptation of the mud nests of the flamingo, just one glance at these static reproductions of the actual objects in their natural environments makes more impression on the child mind than would volumes of verbal description.

These trips furnish also many indirect ethical and social opportunities. As teacher and class walk the Museum halls together, both are storming the guide with a fusillade of questions, and in the light of their common interest, the children see that their teacher is not a pedant but a student like themselves — a big comrade. Then, too, the city is gaining in good citizenship as the sixty heavily shod feet go clattering over the immaculate floors, because sixty busy little heads are thinking of how important they will be at supper-table, when, after father's home-coming, they will tell of wonderful things. Many of these descriptions will result in the child returning to the Museum with his foreign-born parents, and in this way, both parents and child will see for themselves one of the wise ways in which New York City spends her taxes.

A note of constructive criticism was heard from a school-man recently to the effect that if American children are lacking in courtesy as is said, the first step in getting rid of the undesirable trait is to give them something to reverence. The American Museum of Natural History is doing this. It is an institution that children reverence.

As we went through the Museum's halls Tuesday, the wolfish eyes of my dear little Rozansky grew snappingly bright, then the lines about the tight little lips softened, his whole face lit up with the humble reverence which one sees in the faces of old priests, the rough fingers clutched my arm, and he half exclaimed, half whispered, "If we only were to know everything in here, Miss Byrne!"

MUSEUM NEWS NOTES

At the meeting of the Executive Committee, October 18, the following persons were elected Life Members in consideration of gifts or services rendered to the Museum:

MR. CARL HAGENBECK of Stellingen-bei-Hamburg, in recognition of his gift to the Department of Vertebrate Palæontology of valuable models of extinct animals of South America;

MR. ALBERT OPERTI, for his gift of twenty-two oil paintings of the Peary meteorites;

MR. CLARENCE B. RIKER, for generous support of the Museum's ornithological work in South America;

DR. J. H. STEBBINS, in consideration of his gift of a collection of *Lepidoptera*;

DR. CARLOS DE LA TORRE, for assistance with palæontological work of the Museum in Cuba.

THE Museum has received through the New York Entomological Society a collection of insects from the heirs of the late Rev. J. L. Zabriskie. This collection contains more than twenty-nine thousand specimens accurately identified and carefully arranged and is a valuable addition to the entomological series.

A RECEPTION to the National Academy of Sciences will be given by the President and Trustees of the Museum on Wednesday, November 22.

THE Trustees have furnished a room which is reserved for the free use of Members of the Museum and their guests. This room is now open, located on the third floor near the elevators. For the convenience of Members the Trustees have equipped it with comfortable lounging chairs, and reading and correspondence tables. The Museum Journal, the Guide Leaflets and other current Museum publications are on file, and the Museum's collection of the portraits of its founders and benefactors will also be found here. Members, especially when accompanied by their children, are invited to go first to the Members' Room, where a matron will be found on duty, and where wraps and packages may be left while visiting the exhibition halls. A branch telephone connects with all parts of the building; by calling the Information Bureau the Members may summon the instructor who will conduct them through the Museum.

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